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Landis+Gyr



Series 6 Gridstream Mobile Radio T1651/T1661

Data Sheet

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Series 6 Gridstream Mobile Radio T1651/T1661 Data Sheet

Introduction

The Gridstream Mobile Radio (GMR) is a field tool device that enables customers to communicate with Mesh IP and Wi-SUN devices. The device uses the standard USB-C serial cable to connect to a user's PC. Two-way communication with the GMR provides the capability to transmit and receive data from AMI endpoints.

This product is low power mode capable which helps connect to modules in single channel mode.

GMR contains Landis+Gyr's Network Node which is a fully functional, Network Interface Card (NIC) that is mPCIe standard-enabled for simple network and sensor device integration.



Figure 1. Series 6 Gridstream Mobile Radio

Table 1. Series 6 GMR T1651 Specification

Element	Description	
Radio Model	Series 6 GMR T1651	
Communication Protocol (PHY)	IEEE 802.15.4-2020	
MAC/PHY Features		
MAC	Simultaneous multi-band support Automatic selection of 'best' Band based on Link Quality Automatic selection of 'best' Modulation based on Link Quality	
PHY	Adaptive Power Control (i.e., Short range output power back-off) Precision Output Power Management Clear Channel Assessment	
Hardware Capabilities		
Clock Speed	120 MHz	
RAM Memory	640 KB	
FLASH Memory	2 MB + 4 MB External	
RF Modulation	IEEE 802.15.4 SUN FSK, O-QPSK & OFDM	
RF Bands	Sub-GHz & 2.4-GHz Simultaneous Operation	
RF Port	Single 50Ω U.FL Male Connector	
Mechanical		
Operating Temperature	-20 to 65C	
IP Rating	IP53 (when rubber plug is closed)	
Sub-GHz Band Characteristics: North America, Mexico & Brazil		
Network Operating Mode	Series 5 Compatible	Greenfield
Frequency Range (Fc)	USA/Canada/Mexico: 902.4 - 927.6 MHz	902.4 MHz – 926.8 MHz
	Brazil: 902 - 907.5 MH, 915 - 928 MHz	N/A
Channel Width	400 KHz	1200 kHz
Number of Channels	64	20
Multicast Modulation	2-FSK 50 kbps	OFDM Option 1 MCS0 (100 kbps)
Data Rate Coverage	50 kbps - 600 kbps	100 kbps - 2400 kbps
Transmitter Power	50 mW - 800 mW	10 mW - 427 mW (average)
Transmitter Low Power	400 μW (peak)	N/A
Receiver Sensitivity (IEEE 802.15.4)	F2B50 = -108 dBm F2B150 = -100 dBm F2B200 = -99 dBm O3M3 = -107 dBm O3M4 = -105 dBm O3M5 = -102 dBm O3M6 = -97 dBm	O1M0 = -110 dBm O1M1 = -109 dBm O1M2 = -105 dBm O1M3 = -102 dBm O1M4 = -99 dBm O1M5 = -96 dBm O1M6 = -90 dBm
Sub-GHz Band Characteristics: Philippines		
Network Operating Mode	Series 5 Compatible	

Table 1. Series 6 GMR T1651 Specification (Continued)

Element	Description
Frequency Range (Fc)	915.2 MHz - 917.6 MHz
Channel Width	400 KHz
Number of Channels	7
SUN Modulation Support	2-FSK: 50 - 200 kbps OFDM Option 3: MCS3 - MCS6
Data Rate Coverage	50 kbps – 150 kbps
Transmitter Power	50 mW - 800 mW
Receiver Sensitivity (IEEE 802.15.4)	F2B50 = -108 dBm F2B150 = -100 dBm F2B200 = -99 dBm O3M3 = -107 dBm O3M4 = -105 dBm O3M5 = -102 dBm O3M6 = -97 dBm
Sub-GHz Band Characteristics: Hong Kong & Bangladesh	
Network Operating Mode	Series 5 Compatible
Frequency Range (Fc)	920.6 MHz - 924.6 MHz
Channel Width	400 KHz
Number of Channels	11
SUN Modulation Support	2-FSK: 50 - 200 kbps
Data Rate Coverage	50 kbps – 200 kbps
Transmitter Power	50 mW - 800 mW
Receiver Sensitivity (IEEE 802.15.4)	F2B50 = -108 dBm F2B150 = -100 dBm F2B200 = -99 dBm
Sub-GHz Band Characteristics: Australia	
Network Operating Mode	Series 5 Compatible
Frequency Range (Fc)	915.6 MHz - 927.6 MHz
Channel Width	400 KHz
Number of Channels	31
SUN Modulation Support	2-FSK: 50 - 200 kbps
Data Rate Coverage	50 kbps – 200 kbps
Transmitter Power	50 mW - 800 mW
Receiver Sensitivity (IEEE 802.15.4)	F2B50 = -108 dBm F2B150 = -100 dBm F2B200 = -99 dBm O3M3 = -107 dBm O3M4 = -105 dBm O3M5 = -102 dBm O3M6 = -97 dBm
Sub-GHz Band Characteristics: International	

Table 1. Series 6 GMR T1651 Specification (Continued)

Element	Description
Network Operating Mode	2.4-GHz
Frequency Range (Fc)	2410.8 MHz to 2461.2 MHz
Channel Width	1200 KHz
Number of Channels	43
Multicast Modulation	OFDM Option 1 MCS0 (100 kbps)
Unicast Modulation Support	OFDM Option 1: MCS0 - MCS6
Data Rate Coverage	100 kbps - 2400 kbps
Transmitter Power	100 mW - 490 mW (average)
Receiver Sensitivity (IEEE 802.15.4)	O1M0 = -112 dBm O1M1 = -111 dBm O1M2 = -107 dBm O1M3 = -105 dBm O1M4 = -102 dBm O1M5 = -99 dBm O1M6 = -93 dBm

Table 2. Series 6 GMR T1661 Specification

Element	Description
Radio Model	Series 6 GMR T1661
Communication Protocol (PHY)	802.15.4-2015
MAC/PHY Features	
MAC	Automatic selection of 'best' Modulation based on Link Quality
PHY	Adaptive Power Control (i.e., Short range output power back-off) Precision Output Power Management Clear Channel Assessment
Hardware Capabilities	
Clock Speed	120 MHz
RAM Memory	640 KB
FLASH Memory	2 MB + 4 MB External
RF Modulation	IEEE 802.15.4 SUN FSK, O-QPSK & OFDM
RF Bands	Sub-GHz
RF Port	Internal Multi-Band 1dBi Antenna
Sub-GHz Band Characteristics: North America	
Network Operating Mode	Wi-SUN
Frequency Range (Fc)	902.2 MHz – 927.8 MHz
Channel Width	200, 400, 800 & 1200 kHz
Number of Channels	129, 64 31 & 21
Multicast Modulation	2-FSK 50 kbps
Unicast Modulation Support	2-FSK: 50 - 200 kbps OFDM Option 3: MCS2 - MCS3 (100 - 200 kbps) OFDM Option 2: MCS3 - MCS5 (400 - 800 kbps) OFDM Option 1: MCS5 - MCS6 (1600 - 2400 kbps)
Data Rate Coverage	50 kbps - 2400 kbps
Transmitter Output Power	50 mW - 800 mW
Receiver Sensitivity (10% PER, conducted)	F2B50 = -108 dBm
	F2B150 = -100 dBm
	F2B200 = -99 dBm
	O3M2 = -109 dBm
	O3M3 = -107 dBm
	O2M3 = -106 dBm
	O2M4 = -104 dBm
	O2M5 = -101 dBm
	O1M5 = -96 dBm
	O1M6 = -90 dBm

FCC, Industry Canada Compliance

FCC Class B

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the Instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Consult Landis+Gyr or an experienced radio technician for help.



WARNING: Changes or modifications to this device not expressly approved by Landis+Gyr could void the user's authority to operate the equipment.

RF Exposure

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet équipement est conforme aux limites d'exposition aux radiations FCC définies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à une distance minimale de 20 cm entre le radiateur et votre corps. Cet émetteur ne doit pas être situé à proximité ou fonctionner en conjonction avec toute autre antenne ou émetteur.

Industry Canada

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.



NOTE: The GMR uses an internal antenna that complies with aforementioned requirements. There is no provision to use an external antenna.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent émetteur radio (5294A-NG0R1S4LP) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Regulatory Compliance Brazil

Anatel

Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.

Model: T1651

ANATEL ID: TBA

Regulatory Compliance Mexico and Philippines

IFETEL Regulatory blurb will be updated after regulatory certification is obtained.

Regulatory Compliance Bangladesh

BTRC Guidelines

This device complies with BTRC guidelines. This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Regulatory Compliance Hong Kong

This device complies with the HKCA1049 (Issue 1) performance specification issued by the Communications Authority under the Scheme on Certification of Telecommunications Equipment and Industrial, Scientific and Medical (ISM) Equipment by the Local Certification Bodies (LCB Scheme).

Regulatory Compliance Australia

Regulatory blurb will be updated after regulatory certification is obtained.